

## Benefits of Low-Pollution Marine Engines

- Burn 35% to 50% less gas.
- Use up to 50% less oil.
- Save money over the life of the engine.
- Reduce air emissions by 75%.
- Reduce water pollution by reducing the amount of gasoline released into surface waters.
- Are easier to start.
- Have a quicker throttle response.
- Are quieter.
- Reduce smoke and fumes.
- Are less disruptive to wildlife.
- Are better for New Hampshire's environment!



## Low-Pollution Marine Engines *A Cleaner Way to Have Fun!*

The New Hampshire Department of Environmental Services and the New Hampshire Marine Trades Association have teamed up to encourage consumers to purchase and use cleaner-burning marine engines.

If you are in the market for a new outboard motor or PWC, or are considering replacing your existing outboard engine, ask your dealer about the four-stroke or new direct fuel injection two-stroke engines.

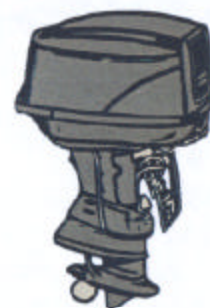
Help keep New Hampshire's  
air and water clean!



For further information, call the  
N. H. Department of Environmental  
Services at  
(603) 271-3503  
or visit the DES web site at  
[www.des.state.nh.us](http://www.des.state.nh.us)

The New Hampshire Department  
of Environmental Services

## Marine Engines and the Environment



*Low-Pollution Engines  
Reduce Air and Water  
Pollution*





## The Problem with Some Outboard Marine Engines

New Hampshire has hundreds of lakes and ponds and thousands of miles of rivers which provide outdoor enthusiasts with many opportunities to enjoy the water. Until recently, most outboard engines and personal watercraft (PWCs) were powered by conventional carbureted two-stroke marine engines.



The PROBLEM with these engines is that they are very inefficient in their use of gasoline and oil. In older carbureted two-stroke engines, as much as 30 percent of the fuel passes through the combustion chamber unburned, releasing pollutants into the environment!

- In the air, unburned gasoline produces hydrocarbons and nitrogen oxides, which contribute to the formation of ground-level ozone. Ozone can irritate the respiratory system and aggravate existing respiratory conditions such as asthma.
- In lakes and rivers, unburned gasoline contributes to elevated levels of benzene, MtBE, and other toxic components of gasoline.



## Low-Pollution Marine Engines Now Available

The GOOD NEWS is that cleaner, low-pollution outboard marine engines are available from New Hampshire marine dealers. These engines are better for the environment, easier to maintain, and more fuel efficient, which translates directly into money savings for the consumer.

### Two Types of Low-Pollution Engines

#### 4-Stroke Engines

- Most fuel efficient outboard marine engine.
- Much quieter than the conventional carbureted 2-stroke.
- Run on gasoline only, so no oil and gas mixing is necessary.



#### Direct Fuel Injection (DFI) 2-Stroke Engines

- More fuel efficient than the carbureted 2-stroke.
- Reduce oil use by 50 percent over the conventional carbureted 2-stroke.
- Do not require routine oil and filter maintenance.
- Much lighter in weight.



## Eco-Friendly Boating Tips

### Fueling Practices

*Proper fueling reduces the introduction of gasoline into the water.*

- Ensure boat stability when fueling.
- Use an approved gasoline container you can handle easily and hold securely.
- Use bilge pillows and engine pads to absorb oils and fuels, and dispose of them properly.
- Close the vent on portable gas tanks when the engine is not in use or when the tank is stored.
- Do not rely on automatic nozzle shutoffs. Use a funnel or spout with an automatic stop device. Pour slowly and avoid topping off gas tanks.



### Engine Maintenance

*Good engine maintenance improves operating efficiency and reduces emissions.*

- Limit engine operation at full throttle, and eliminate unnecessary idling.
- Repair gas and oil leaks immediately.
- Check, clean and flush the engine away from the water.
- Prepare engines properly for winter storage.
- Contain all waste and recycle or dispose properly.